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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,944	08/20/2003	Yoshiaki Hasegawa	63979-032	3843

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EXAMINER

VAN ROY, TOD THOMAS

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/643,944	Applicant(s) HASEGAWA ET AL.	
	Examiner Tod T. Van Roy	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6,7 and 9-14 is/are allowed.
- 6) ☒ Claim(s) 1,3-5,15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The examiner acknowledges the amending of claims 1, 5-6, 13 and 15, as well as the cancellation of claim 8.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-5, and 15 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, see Remarks, filed 02/27/2006, with respect to claims 6-7, and 9-14 have been fully considered and are persuasive. The rejection of the claims has been withdrawn.

The examiner agrees that the combination of JP' 214 with Yoshie is not obvious in that the placement of the n-doped layer in relation to the light guide layer in each structure is not corresponding.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 recites the limitation "the p-type impurity" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al. (JP 11-251687, applicant submitted prior art).

With respect to claim 1, Hasegawa discloses a semiconductor laser in which an n-type semiconductor layer (fig.1a #13), an active layer (fig.1a #15), and a p-type semiconductor layer are stacked in this order on a substrate (fig.1a #10); the active layer comprising a well layer composed of InGaN (fig.1a #15 abs.); the semiconductor laser comprising an intermediate layer sandwiched between the active layer and the p-type semiconductor layer (fig.1a #16); the intermediate layer including no intentionally added impurities and being composed of a gallium nitride-based compound semiconductor (abs., [0029], no impurities taught in the layer formation); the intermediate layer being composed of GaN or InGaN (GaN, abs.); and with no p-type semiconductor layer being present between the active layer and the intermediate layer.

With respect to claim 3, Hasegawa discloses the semiconductor laser is a Group III-V nitride semiconductor laser (abs.), the n-type semiconductor layer contains Si as an n-type impurity ([0028]), and the p-type semiconductor layer contains Mg as a p-type impurity ([0030]).

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With respect to claim 4, Hasegawa discloses the concentration of a p-type impurity in the active layer is about $1E17\text{ cm}^{-3}$ or lower ([0029], no added impurities, so is lower).

With respect to claim 5, Hasegawa discloses forming the device as outlined in the rejection to claim 1 ([0026-32]).

With respect to claim 15, Hasegawa discloses the thickness of the intermediate layer is not less than 60nm and not more than 160nm ([0029], 100nm).

Allowable Subject Matter

Claims 6-7, and 9-14 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 6 and 13 are believed to be allowable as a GaN based semiconductor laser having the stated layers wherein the diffusion preventing layer is doped with an n-type impurity of not less than about $1E19\text{ cm}^{-3}$ and not higher than about $6E19\text{ cm}^{-3}$, was not found to be taught in the prior art, nor an obvious combination of the prior art. As cited in the previous office action (Akitaka et al., JP 10-200214 A), laser diodes with similar structures have been created, but with levels of doping which do not meet the limitations stated in claims 6 and 13 of the instant invention, and motivation was not found to exist for adjusting the stated levels to those in the current claims.

Claims 7, 9-12 and 14, are allowable as they depend from allowable claims 6 and 13.

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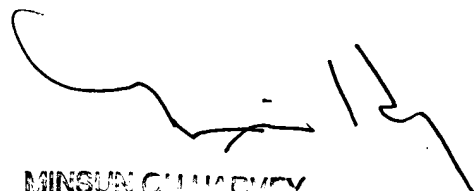
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR



MIN SUN C. HARVEY
PRIMARY EXAMINER